

ABSTRACT OF THE DISCLOSURE

A compound of the general formula $R^1R^2MR^4R^5$ is disclosed wherein R^1 and R^2 are independently an aryl, alkyl, alkenyl, epoxy or alkynyl group, wherein at least one of R^1 and R^2 is fully or partially fluorinated, wherein M is selected from group 14 of the periodic table, wherein R^4 and R^5 are independently an alkoxy group, OR^3 , or a halogen group, X, except where M is Si, R^4 and R^5 are both ethoxy groups or both chlorine groups, and R^1 and R^2 are perfluorinated groups. This compound formed can be further reacted to attach an additional organic R group, and/or hydrolyzed, alone or with one or more similar compounds, to form a material having a molecular weight of from 500 to 10,000, which material can be deposited on various substrates as a coating or deposited and patterned for a waveguide or other optical device components. Methods for making compounds of the general formula $R^1MR^4R^5R^6$ are also disclosed.